

## REMARKS

Claims 1-8 and 10-16 remain in the application, claims 9, and 17-24 having been canceled.

Claims 2-4, 5, 8-10 and 13-16 have been amended for clarity. Independent claims 1 and 11 have been amended to include the limitations of a metal gate and a high k dielectric. Support for these amendments can be found in paragraphs 17 and 16 respectively, of the present application, for example. No new subject matter has been added with these amendments.

### A. Claim Objections

Claims 2-4, 5, 8-10 and 13-16 have been amended for clarity. Thus, withdrawal of the objections to claims 2-4, 5, 8-10 and 13-16 is respectfully requested.

### B. 35 U.S.C. § 102(e)

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

#### Tsukamoto- Claims 1-5, 7-8, 10-14

Claims 1-5, 7-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the U.S. Patent No. 6,040,224 issued to Tsukamoto, et al. (hereinafter “Tsukamoto”) (Office Action, page 3). The Office relies on Tsukamoto for a teaching of a metal layer disposed on a gate oxide. However, Tsukamoto does not disclose the limitations of a metal gate disposed on a high k dielectric, as do amended claims 1 and 11, from which claims 2-5, 7, 8, 10 and 12-14 depend respectively. Tsukamoto discloses a polysilicon gate wherein a metal silicide is used to lower the

contact resistance of the polysilicon gate. Tsukamoto further discloses silicon dioxide as the gate dielectric, and does not disclose the use of a high k dielectric. Therefore, since Tsukamoto does not teach or suggest all of the limitations of claims 1-5, 7-8, 10-14, it is respectfully submitted that claims 1-5, 7-8, 10-14 are not anticipated by Tsukamoto. Thus, reconsideration and withdrawal of the Section 102(e) rejection of claims 1-5, 7-8, 10-14 are respectfully requested.

Zhang- Claims 1-3, 5, 7-8, 11-14

Claims 1-3, 5, 7-8, 11-14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by the Zhang (Office Action, page 3). The Office relies on Zhang for a teaching of a high k gate oxide. However, Zhang does not disclose the limitation of a high k dielectric, as do amended claims 1 and 11, from which claims 2, 3, 5, 7, 8, and 12-14 depend respectively. Zhang discloses silicon dioxide as the gate dielectric, and does not disclose the use of a high k dielectric. Therefore, since Zhang does not teach or suggest all of the limitations of claims 1-3, 5, 7-8, 11-14 it is respectfully submitted that claims 1-3, 5, 7-8, 11-14 are not anticipated by Zhang. Thus, reconsideration and withdrawal of the Section 102(e) rejection of claims 1-3, 5, 7-8, 11-14 are respectfully requested.

C. 35 U.S.C. § 103(a)

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must

both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Tsukamoto in view of Bustos-Claim 15

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsukamoto in view of Bustos (Office Action, page 4). The Office contends it would have been obvious to select the material of Bustos to be incorporated in the device of Tsukamoto, since a work function range is subject to routine experimentation and optimization.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). Both Tsukamoto and Bustos teach a non-high k gate dielectric. Because neither Tsukamoto nor Bustos teach or even suggest the limitation of a high k gate dielectric, as does claim 11 from which claim 15 depends, claim 15 is not rendered obvious by Tsukamoto in view of Bustos. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claim 15 is respectfully requested.

Tsukamoto in view of Halliyal-Claim 16

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsukamoto in view of Halliyal (Office Action, page 5). The Office contends it would have been obvious to select the material of Halliyal to be incorporated in the device of Tsukamoto, in order to have a suitable high-k gate dielectric process.

"To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art." In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). Because neither Tsukamoto nor Halliyal teach or even suggest the limitations of a metal

gate disposed on a high k gate dielectric, as does claim 11 from which claim 16 depends, claim 16 is not rendered obvious by Tsukamoto in view of Halliyal. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claim 16 is respectfully requested.

Tsukamoto in view of Goto-Claim 6

Claim 16 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Tsukamoto in view of Goto (Office Action, page 6). The Office contends it would have been obvious to utilize the pulse timing of Goto into the process of Tsukamoto, since such timing is subject to routine experimentation and optimization.

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). Because neither Tsukamoto nor Goto teach or even suggest the limitations of a metal gate disposed on a high k gate dielectric, as does claim 1 from which claim 6 depends, claim 6 is not rendered obvious by Tsukamoto in view of Goto. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claim 16 is respectfully requested.

Zhang -Claim 15

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang (Office Action, page 6). The Office contends it would have been obvious to select the work function range of the metal layer because such selection is subject to routine experimentation and optimization.

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). Because Zhang does not teach or even suggest the limitations of a metal gate disposed on

a high k gate dielectric, as does claim 11 from which claim 15 depends, claim 15 is not rendered obvious by Zhang. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claim 15 is respectfully requested.

Zhang in view of Goto-Claim 6

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Zhang in view of Goto (Office Action, page 7). The Office contends it would have been obvious to utilize the pulse timing of Goto into the process of Zhang, since such timing is subject to routine experimentation and optimization.

“To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art.” In *re Royka*, 490 F.2d 981,180 USPQ 580 (CCPA 1974). Because neither Zhang nor Goto teach or even suggest the limitations of a metal gate disposed on a high k gate dielectric, as does claim 1 from which claim 6 depends, claim 6 is not rendered obvious by Zhang in view of Goto. Thus, reconsideration and withdrawal of the Section 103(a) rejection of claim 6 is respectfully requested.

In view of the foregoing remarks, the Applicants request allowance of the application. Please forward further communications to the address of record. If the Examiner needs to contact the below-signed Attorney to further the prosecution of the application, the contact number is (503) 264-0944.

Respectfully submitted,

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/Kathy J. Ortiz/  
Kathy Ortiz  
Attorney for Applicants  
Reg. No. 54,351